Multinodular goiter found in patient presenting with a pituitary macroadenoma in the setting of acromegaly

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Introduction

Acromegaly is a hormonal disorder as a side effect of growth hormone (GH) hypersecretion. Increased incidence of toxic multinodular goiter and thyroid carcinoma have been reported. We present a case of a patient with acromegaly who presented with a toxic multinodular goiter and hyperthyroidism.

CASE

A 56-year-old female with past medical history of hyperthyroidism on methimazole presented with complaint of blurry vision and dizziness. On physical exam, she was found to have large goiter and physical features consistent with acromegaly including abnormally large hands, feet, forehead, jaw and nose. IGF-1 was found to be elevated with increased levels of growth hormone (IGF-1:764 ng/ml; GH: 40.6). Thyroid stimulating immunoglobulin was negative. Thyroid hormone and TSH levels were well-controlled on methimazole (TSH: 0.618 mU/ml, T4: 1.20 ng/dl T3: 3.14 pg/ml). Gonadotropins, prolactin and ACTH levels were normal (Prolactin: 8.6 ng/dl, LH: 24.4, FSH: 46.8, Testosterone total: 11.5 ng/dl, Cortisol: 3.3 mcg/dl, ACTH: 9.7 pg/ml). She underwent pituitary MRI which showed a 2.2 cm x 1.6 cm x 1.9 cm intrasellar mass likely reflecting a macroadenoma. Patient underwent endoscopic pituitary tumor resection. Post-operatively, thyroid ultrasound was performed which was consistent with a multinodular goiter with at least 4 discrete solid nodules with calcifications and hyperechoic shadows. Patient underwent total thyroidectomy with benign surgical pathology.

References:

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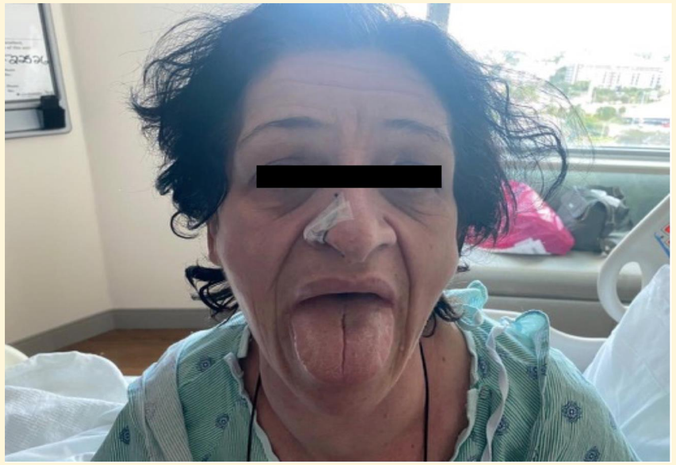
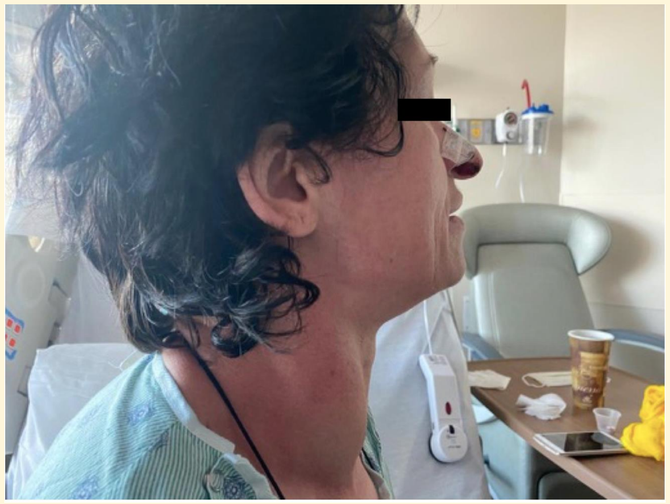
IMAGES





DISCUSSION

The high prevalence of thyroid pathology in patients with acromegaly is well-known. Retrospective studies have analyzed the thyroids of patients after diagnosis of acromegaly found that the duration of illness of acromegaly is significantly longer in patients with moderately to markedly enlarged diffuse goiter or adenomatous goiter than that of patients with no palpable goiter to small diffuse goiter ($p<0.05$)[1]. This contributes to the theory that long-term stimulation by GH and IGF-1 of thyroid follicular cells are responsible for goiter and subsequent formation of multinodular goiter. Moreover, thyroid volume has been correlated with the estimated duration of untreated acromegaly ($p<0.001$)[2]. What makes this case particularly interesting is the presence of toxic multinodular goiter in our patient. While it is reported that up to 92% of acromegalic patients have goiter, most (67%) are euthyroid and about 25% are hypothyroid[3], meaning the vast majority are non-toxic nodular goiters. Acromegaly and hyperthyroidism is not as well described in the literature and is reported to be seen in anywhere from 3.5-26% of acromegalic patients[4]. Given the significant size (two nodules >2cm, the largest measuring 5.1cm) and characteristics of our patient's nodules, there was concern for thyroid cancer. While data regarding the association between acromegaly and thyroid cancer remains controversial, it is important to screen acromegalic patients with US for thyroid cancer as it occurs significantly more often in acromegalic patients than in the general population[5].

CONCLUSION

This patient with acromegaly was found to have toxic multi-nodular goiter which is a rare phenomenon. While the exact mechanism is not well understood, studies have shown there is an influence of GH and IGF-1 on the thyroid.